[U H06-001741]

* NOTICES *

DETAILED DESCRIPTION

[Detailed explanation of the device]
[0001]
[Industrial Application]
This design is related with the piston engine of a four cycle which improved distance.
[0002]
[Description of the Prior Art]
Conventionally, by the piston engine of a four cycle, while performing each distance of inhalation-compression-explosion-exhaust air, a piston goes back and forth between a top dead center and bottom dead points two times, and a crankshaft rotates two times, but it is the work a piston works outside between them only at the working-stroke time. However, since a both-way distance to which, as for the conventional organization, the distance of a piston carries out inhalation of air and compression, and a both-way distance which performs explosion and exhaust air are the same distance length, it does not work effectively among 2 round trips as 1/4 line, but a loss is large and efficiency is low [a piston].
[0003]
[Problem(s) to be Solved by the Device]
It is originated in view of said actual condition, and this design aims at providing the four-cycle engine which can cancel said fault which the conventional four-cycle engine has by making a working stroke and an exhaust stroke longer than a suction stroke and a compression stroke.
[0004]
[Means for solving problem]
The sun gear with which the four-cycle piston engine of this design was fixed in the piston rod end face, It pivots in the link fixed to said epicyclic gear of the planetary gear mechanism which consists of an epicyclic gear and an internal gear which meshes with this epicyclic gear while rotating the circumference of this sun gear, As the linear reciprocating motion of the piston was changed into rotational movement of the internal gear according to said planetary gear

mechanism, the above-mentioned problem was solved by composition making explosion and an exhaust stroke longer than inhalation and a compression stroke.

[0005]

[Function]

When the sun gear of a planetary gear mechanism is fixed, an epicyclic gear rotates the circumference of this sun gear and there is a point fixed to the epicyclic gear in the exterior of the pitch circle of an epicyclic gear, the locus which the point draws serves as a curtate trochoid, and if it is on a pitch circle, it will serve as a cycloid. Therefore, since the end face will also draw the same locus as the above if the end face of a piston rod is pivoted in one point to which the epicyclic gear was fixed, the stroke of the linear reciprocating motion of a piston will be regulated in connection with it.

If the number of teeth and pitch diameter of a sun gear and an epicyclic gear are made equal and the number of teeth and pitch diameter of an internal gear are set up twice now, respectively, as shown in drawing 4, while an epicyclic gear will revolve one time around the sun, an epicyclic gear rotates two times and an internal gear rotates 1.5 times. The locus will be set to curtate trochoid curve m as shown in drawing 4 (b) (**) if it takes on the line which an epicyclic gear meshes exactly with a sun gear the point P of the outside fixed to the epicyclic gear (it is considered as the distance s from the center of an epicyclic gear) in the upper part, and connects the center. Therefore, when a piston rod end face is pivoted in this P point, a piston, When a points include the point P in a figure, are in the top dead center e, and it descends gradually with rotation of an epicyclic gear from this position, Reach the 1st bottom dead point f at b point, go up from there further, reach c point of the again same height as said a point, and it becomes the top dead center e, If it descends from there and d point is reached, a piston reaches the 2nd bottom dead point g of the maximum falling position, and will go up from there, will reach said a point, and will serve as the top dead center e, and it will go to a piston and come back two times in the meantime. So, if between a compression stroke and c-d (e-g) is made into a working stroke and between d-a (g-e) is made into an exhaust stroke for between a suction stroke and b-c (f-e), between a-b (e-f), Only 2D (D is a pitch diameter of a sun gear and an epicyclic gear) can lengthen like working-stroke ******** rather than a suction stroke and a compression stroke. That is, the stroke of the working stroke which works outside can be made longer than a suction stroke and a compression stroke, and an efficient four stroke cycle engine is obtained.

[0006]

A difference with a working stroke, an exhaust stroke and a suction stroke, and a compression stroke can be adjusted by being able to adjust the stroke of a piston by ** which adjusts the distance from the central point of the epicyclic gear of said point P, as shown in drawing 4 (**), and changing the pitch diameter of an epicyclic gear and a sun gear. The rotation of an internal gear can control the number of rotations of an output shaft by being taken out as rotation of the output shaft which gears with this gear and is transmitted, and changing both gear ratio.

[0007]

[Working example]

Hereafter, the working example of this design is described in detail based on Drawings. Drawing 2 shows the important section of the piston engine of this example, it is a piston which reciprocates the inside of a figure, and the inside of the cylinder which one does not illustrate, and the base of the piston rod 3 pivoted by the piston pin 2 is connected with the rotary motion converter 5 which consists of planetary gear mechanisms. The ring gear 8 by which the external tooth 6 and the internal tooth 7 were formed in a peripheral face and inner skin as for the rotary motion converter 5, It has a planetary gear mechanism of a couple which it comes to provide a couple every, respectively, and the sun gear 9 fixed to the central part and the epicyclic gear 10 which meshes with this sun gear 9 and said internal tooth 7 engage the output-tooth vehicle 15 to the external tooth 6 of this planetary gear mechanism, and is constituted. The number of teeth and pitch diameter of said sun gear 9 and the epicyclic gear 10 are the same, and the internal tooth 7 of the ring gear 8 has the twice as many number of teeth as this and pitch diameter.

[Claims]
[Claim 1]A sun gear fixed in a piston rod end face in a piston engine of a four cycle, It pivots in a link fixed to said epicyclic gear of a planetary gear mechanism which consists of an epicyclic gear turning around the circumference of this sun gear, and an internal gear which meshes with this epicyclic gear, A piston engine of a four cycle making explosion and an exhaust stroke longer than inhalation and a compression stroke as a linear reciprocating motion of a piston was changed into rotational movement of an internal gear according to said planetary gear mechanism.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]It is a distance explanatory view of the piston engine concerning the working example of this design.
[Drawing 2]It is an outline perspective view of the piston engine concerning the working example of this design.
[Drawing 3](b) They are a partial section front view of the piston engine in the state of being in the 2nd bottom dead point, and a partial section front view in the state where (**) is in the 1st bottom dead point.
[Drawing 4]It is the operation explanatory view.
[Explanations of letters or numerals]
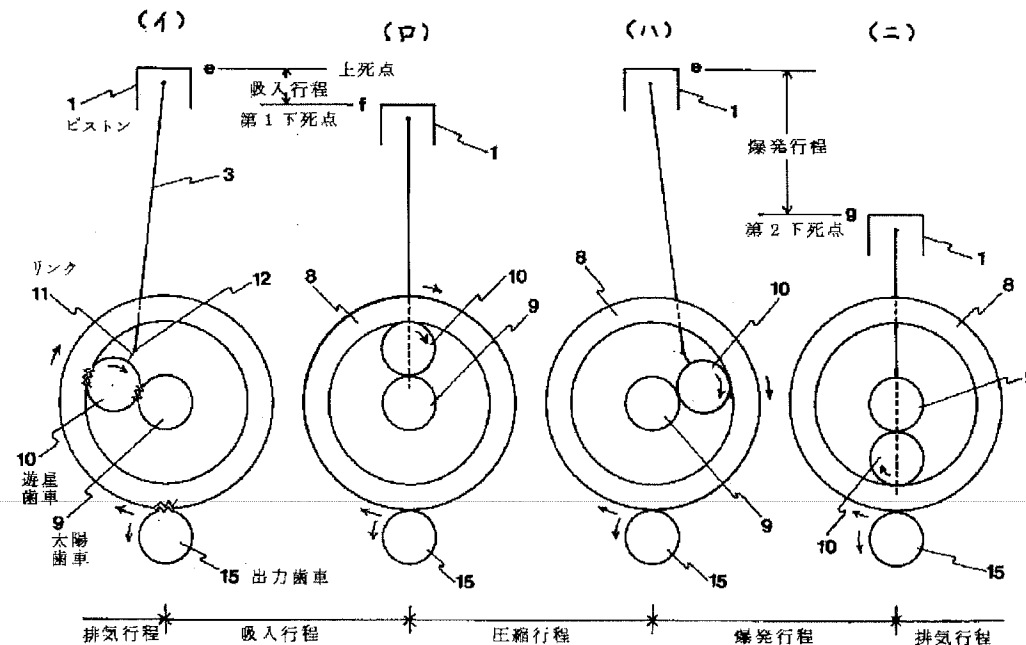1 Piston 2 Piston pin
3 Piston rod 5 Rotary motion converter
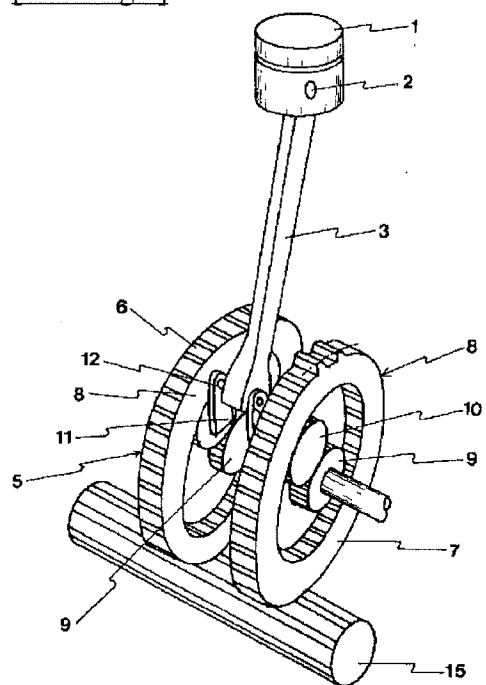8 Ring gear 9 sun gear
10 Epicyclic gear 11 link
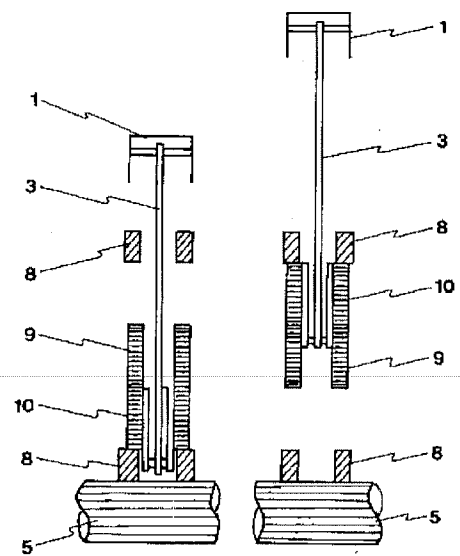12 Pin 15 Output-tooth vehicle

DRAWINGS

[Drawing 1]

（イ）　（ロ）　（ハ）　（ニ）

上死点
吸入行程
第1下死点
爆発行程
第2下死点

1 ピストン
リンク
11
12　8
10　9
8
10
10
8
9

10 遊星歯車
9 太陽歯車
15 出力歯車
15

排気行程　吸入行程　圧縮行程　爆発行程　排気行程

[Drawing 2]

[Drawing 3]
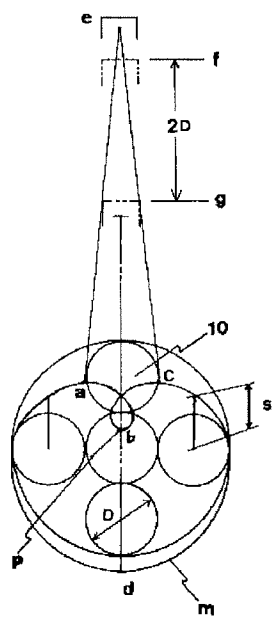(イ)   (ロ)

[Drawing 4]

（イ）

e

f

2D

g

10

a

c

b

s

D

P

d

m

（ロ）

1

吸入行程　圧縮行程

排気行程　爆発行程

10

10

9

7

m

9

m

7